PCT

(51) International Patent Classification 7 : G06F 17/60	A1	(11) International Publication Number: WO 00/63808
		(43) International Publication Date: 26 October 2000 (26.10.00)

(72) Inventors; and
(75) Inventors/Applicants (for US only): COTTON, Kevin [US/US]; 31 Towne Commons Way, Cincinnati, HO 45215 (US). HEINZE, Torsten [DE/US]; 7825 Willow Run Court, Westchester, OH 45069 (US). BARNETT, Jason [US/US]; 812 Ashton Park Drive, Greenwood, IN 46143 (US). SAYATOVIC, Brian [US/US]; 2809 Highcrest Court, Cincinnati, OH 45251 (US).
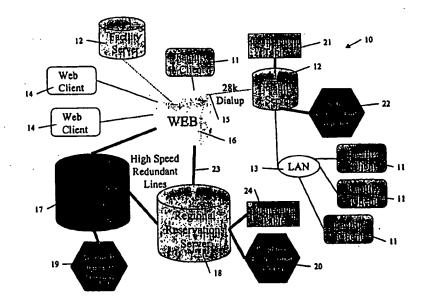
(54) Title: TEE TIME RESERVATION SYSTEM

(57) Abstract

A multi-tiered reservation system makes possible high speed reservations for industries such as restaurants, golf courses, doctors offices, spas, etc., over the internet despite low speed connections to individual facilities. A facility server (12) is at each facility. Multiple facility clients (11) can manage the data on the facility server (12), and can be located locally or remotely from the facility server (12). A regional database (20) is kept in synchrony with the facility servers (12) in real time. A "cursor assistant" provides context sensitive help in the form of text that moves around with the mouse cursor. The facility clients (11) for the golfing industry include advanced features for planning a golf course tee sheet with as many as 72 holes. User friendly web site development tools allow non-technical users to set up and maintain electronic communities including newsletters, calendars, etc.

TEE TIME RESERVATION SYSTEM

CROSS-REFERENCE TO RELATED APPLICATIONS

This application claims the benefit of the filing date of U.S. provisional
application No. 60/128,829 filed April 16, 1999.

BACKGROUND AND SUMMARY OF THE INVENTION

The present invention relates generally to a system and method for making
reservations for various kinds of businesses using the internet. More particularly, the
invention relates to internet based reservation systems wherein local facilities connect to
the internet through a simple telephone line.

Conventional reservation systems that interface with customers over the internet
generally require a high speed connection to ensure prompt responses to customer
inquiries. However, some businesses such as golf courses and tennis clubs do not have a
high speed connection available, leading to slow responses which their internet clients
generally find to be unacceptable. In addition, conventional reservation systems
typically will not provide a confirmation of a customer reservation when the connection
to the facility is interrupted, resulting in a potential loss of clients. Additionally,
conventional golf reservation systems generally are paper based systems that do not
optimize the usage of a golf facility's courses and related services. The tee time
reservations for a golf course include multiple planning methods that are difficult to
schedule and subsequently modify. Intermixing planning methods such as straight 18,
wave and shotgun start as well as defining set paths for defining the courses a golfer or
league will play during a given day further complicates the task of maximizing the usage
of a golf facility's courses.

Therefore it is desirable to provide a reservation system that provides fast
response to facilities that are connected by means of a simple telephone line. It is also
desirable to fault tolerance that enables the system to continue to accept reservations
when facility servers fail or when the connection of the facility server is interrupted.

Additionally, it is desirable to provide a reservation system for golf related
services that replaces a paper Tee Sheet with an interactive Tee Sheet. It is also
desirable to make tee times available for WEB bookings. Additionally, it is desirable
to provide all golf course information (such as policies, driving directions) for WEB

bookings. In addition, it is desirable to take tee times 24 hours a day, 7 days a week. It is also desirable to reduce golf course management costs and provide golf course managers with a powerful reporting tool. Since many golf courses are located in areas where high speed communications lines are either unavailable or prohibitively costly, it

5   is desirable to have a system which can function using only a simple telephone line for communications. In addition, because a golf course cannot afford to lose track of its tee time reservations in the event of a network failure, it is necessary that the system continue to operate autonomously despite network failures.

The present invention provides a reservation system for the selection and review
10   of information communicated between a regional server and a local facility server interconnected by the internet. A facility server is located at each facility. One or more facility client devices are connected to each facility server, either by way of a local area network connection or over the internet. A database of reservation and customer information is stored on both the facility server and the regional server. A user interface
15   running on the facility client devices provides staff members means to enter and review reservation information. A client application, which can run on any PC connected to the internet equipped with a web browser, provides a user interface for users seeking to reserve times. A synchronizer copies any changes in the reservation information between the regional server database and the facility server database, as well as to subsets of the
20   data stored on the facility client devices, such that reservation information is consistent on all three types of devices.

For a more complete understanding of the invention, its objects and advantages, reference may be had to the following specification and to the accompanying drawings.

25   BRIEF DESCRIPTION OF THE DRAWINGS

Figure 1 is a network datagram illustrating a preferred embodiment of of the invention;

Figure 2 is a datagram illustrating the structure of the local and server databases;

Figure 3 is a flow diagram showing the process for booking a reservation;

30   Figure 4 is a flow diagram showing process for setting up a facility tee-sheet; and

Figure 5 is a datagram illustrating the functions of the WEB application.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

Referring to Fig. 1, a reservation system 10 for golf related services in accordance with the principles of the invention is illustrated. Although the presently preferred embodiment of the invention is a golf related reservation system, the scope of the invention includes reservation systems for other businesses such as tennis clubs, restaurants, racquetball clubs, spas, doctor offices, dentist offices, eye doctor offices, and car repair shops. Reservation clients such as golfers may connect to the reservation system 10 through a home or office computer, Web client 14, which is connected to the internet using standard internet browser software. Through a Web client 14, a golfer is able to access the reservations data stored on a regional members server 17 and a regional reservations server 18 as the golfer selects a golf tee time to reserve. The scope of the invention includes employing a single regional server that includes both a regional members database 19 and a regional reservations database 20. The facility clients 11 supply the main user interface for the golf course staff in the form of an interactive Tee Sheet. Golf course managers use the interactive Tee Sheet in order to plan golf course occupation, set up play types and reserve tee-times. Each pair of regional servers 17 and 18 communicate by way of high speed connections 23 to the internet 16 to a plurality of facility servers 12, which in turn communicate by way of local area networks 13 or indirectly back through the internet 16, to a plurality of facility clients 11. The last step in communication to and from the facility server 12 and the internet 16 is by way of a simple telephone line 15 running at a slow speed. Many of the unique aspects of the reservation system 10 are designed to accommodate the slow speed of the telephone line 15. Each participating golf facility has at least one facility server 12 containing a local database 22 to store facility related data such as courses, member information, client information, tee-time reservations, and course pricing. The preferred configuration of a golf facility server 12 includes a Personal Computer (PC) with an attached modem, true color graphics card and laser printer. The facility server application as well as the facility client application are executable modules developed using the Delphi development environment and do not require any other software other than the operating system.

The local reservations database 22 stored on the facility server 12 of the preferred embodiment uses an MS Access File and is designed using the entity

relationship method. The tables and fields are implemented to use the same database structure as the regional reservations server database 20 to facilitate easy synchronization. The regional members database 19 contains membership data that does not relate to tee time reservations and does not need to be replicated to the facility

5   server 12. Because the facility clients 11 can access the facility server 12 by way of the internet, a temporary backup facility server can be located regionally, and can be loaded with the duplicate data contained in the regional reservations database 20 in the event of a failure of the local facility server 12. This would allow the golf course to continue operation even if the facility server 12 was destroyed because an exact replica

10   of the destroyed facility server would then be available regionally. Without the unique architecture of the reservations system 10, which optimizes the use of the slow telephone line 15 connected to the facility, such a backup procedure would not work because it would be roughly 100 times too slow.

       The Web client 14 application is written to run as a web application

15   using standard web browser software such as Internet Explorer 4. The facility server 12, facility client 11 and regional server 17 and 18 applications are all written using Inprise's Delphi product, which creates small efficient executable logic modules which do not require any browser software, DLL software, or web server software. The complex graphics which make the human interface on the facility client 11 very easy to

20   use are all contained in the Delphi executable that makes up the facility client application. This makes the human interface very fast while at the same time greatly reducing the amount of communication required between the facility client 11 and the facility server 12. This makes it possible to locate a facility client 11 remotely, communicating through the web 16 and the slow telephone line15, without adversely

25   affecting the speed of the human interface at the facility client 11.

       Communication over the slow telephone line 15 between the facility server and the regional servers 17 and 18 is made efficient by: 1) compressing the data sent so that there is less to communicate, 2) prioritizing the data sent so that time sensitive items are sent first, 3) keeping copies of the database at both locations synchronized,

30   so that most requests can be answered without any communication at all over the slow telephone line15, 4) sending only the changes to the database 22 over the slow

telephone line 15 instead of full queries, 5) making the connection between servers a persistent IP (Internet Protocol) connection. Usually IP connections are not persistent, so that every communication involves a significant overhead to set up the IP aspects of the communication. By developing logic to support a persistent IP connection,

5   communication over the slow phone line 15 can be as much as 5 times more efficient. 6) in addition to all the above items, the logic to perform the communication, known as "streamer logic" has been carefully designed to be very efficient. As a result of all these innovations, a simple telephone line 15 easily supports the reservation system 10.

The facility server 12 of the preferred embodiment includes an application

10   written using Delphi and operates under the control of the Windows 98, Windows NT 4.0 or Windows 2000 operating systems. The facility server 12 application was designed as one tier of a multi-tiered system. The other tiers include the regional servers 17 and 18, the facility clients 11, and potentially higher levels of servers (not shown) which would connect to the regional servers 17 and 18. The data in the databases is

15   duplicated as required at each tier of the system so that access to the data is always local and therefore very fast and does not require high speed communications. The data located in each tier is kept in synchrony through automatic distribution of any data changes to the other tiers of the system. In the event of a system failure, all of the data can be forwarded in a batch to reinstate a copy of the data at a different tier. The facility

20   server 12 is a single executable module of code that does not depend on any other software, such as a web browser, DLLs, or Personal Web Server. The facility server 12 application is small in size and can be distributed very easily on diskettes, CD ROMs or by downloading over the Internet. Because the installation process involves nothing more than storing the executable module, it can be done remotely. This is in great

25   contrast to other approaches to reservation systems, which require very difficult installation procedures and often the availability of a local installation expert.

Referring to Figure 2, the interrelationships between the elements of the reservations database 22 of figure 1 are illustrated. In the preferred embodiment, the regional server copy of the reservations database 20 is carried in an SQL Server 6.5

30   database under the control of Windows NT 4.0. However, it could just as easily be carried in an Oracle database running under a different operating system, such as Linux. Further description of the individual elements of the reservations database is provided

throughout the remainder of this specification. The regional server database 20 includes, in addition to the reservations data stored on the facility server database, fields for the facility ID of each unique golf course facility as well as global information such as a client's favorite golf courses and a list of golf buddies for each client.

5   Again referring to Figure 1. Each facility server 11 connects to the Internet 16 through a connection which can be as simple as a 28k dial up telephone line 15, though higher speed lines work equally well. The facility server 11 application includes an automatic dialer which establishes the connection to the regional servers 17 and 18 when the facility becomes disconnected. This is an important feature, because it is in

10   the nature of dial-up telephone lines that they will disconnect multiple times each day, so an automatic reconnection device is essential. When the automatic dialer on the facility server 12 reconnects with the regional servers 18 and 19, it must acquire a new IP address and give that address to the regional server 18, where it is stored in a connection table 24. The type of connection established is known as a "persistent" IP

15   connection because the system remembers all of the details of the connection and does not require the overhead of re-establishing that data every time there is a communication. The use of a persistent IP connection improves efficiency by several hundred percent. The connection table provides the regional server 18 with information about the connection status of each facility server 12 including a

20   timestamp. When the connection with a facility breaks, the regional server 18 removes the IP address from its connection table and updates the timestamp. While the facility connection is down, reservations made by telephone or in person are stored in a transaction table 21 located at the facility.

         . Referring to Figure 3, the process for booking a tee time is illustrated. Since

25   tee times can be booked from either the internet or the facility, the system employs real time locking and synchronization methods to avoid double booking and to keep the golf course facility operational. If the internet connection of one participating facility should be down, then booking tee times on the Internet for this particular facility is disabled, but the facility can still take tee times via phone or in person. The process

30   ensures that bookings are identical on the facility 22 and regional reservations databases 20.

When the tee time is booked over the internet 16, first the connection table 24 is queried to determine if the facility has a corresponding IP address, step 30. Next, at step 32, the connection of the facility server 12 to the internet 16 is verified. If a connection does not exist, then the IP address is removed from the connection table 24.

5   Finally, at step 34, having verified the connection, record locking is started at the facility. The reserved tee time is then entered into the facility database 22 and the electronic Tee Sheet on each facility client 11 is updated in real time. The internet bookings literally "pop up" on the facility clients 11, without interrupting the workflow of the golf course staff taking tee times locally using the facility clients 11.

10   No reloading or refreshing of the screen is required.

When a record on the facility server 12 is added, updated or deleted, an attempt is made to update the regional server 18, in order to make the same changes to the regional server database 20. At step 36, a click on the Tee Sheet on a facility client 11, causes a transmission to all tiers of the system which marks the time slot as "busy."

15   If the facility is connected to the Internet 16 the changes are done immediately, step 38. If the connection is temporarily down, each record change is recorded in a transaction table 21, step 40. Once the facility connection is back up, a re-synchronization takes place, in order to keep data consistent between all tiers of the multi-tiered system.

Facility Set-up

20   Referring to Figure 4, the process of setting up an electronic Tee Sheet is illustrated. The Tee Sheet provides the ability to customize the application to the unique needs of a golf course within minutes, step 44. The Tee Sheet can be changed to represent a 9-hole, an 18-hole, a 27-hole, a 36-hole, or a 54-hole golf course through an automated process. Other items that can be customized include the interval between tee

25   times at various times during any day, the number of players allowed in a group, the facility opening and closing hours by day of the week, a description of the course policies, and a list of golfer e-mail addresses for automated notification.

Tee Sheet

30   The Tee Sheet is displayed on the facility client 11 in the form of a specially designed electronic grid which is something like a spreadsheet. The electronic grid makes possible many different alternative views of the Tee Sheet, and can switch

between them very rapidly. For example, the golfers in a foursome can be displayed horizontally or vertically, in expanded or contracted form, and switching takes a single click of the mouse. The electronic grid also makes possible a multi-layer "undo" facility so that users can back out their changes if they make a mistake. Other methods of

5   displaying a Tee Sheet are not this flexible and cannot perform undo functions. The appearance of the reservation system Tee Sheet was very carefully designed to mimic a paper Tee Sheet, because the users are not usually familiar with computers and need a system that is familiar to them.

The facility staff can literally paint the available tee times onto the interactive

10   Tee Sheet using a mouse. Planning golf course occupation such as reservations, outings, tournaments and leagues throughout a golf year is facilitated by the capability to paint tee times onto the Tee Sheet. As a result time slots appear color coded on the Tee Sheet and are stored as available or unavailable time frames in the reservations database 22. A synchronization process reflects those entries in real time on the regional reservations

15   database 20, so that available tee times of that facility are searchable by golfers through Web clients 14 over the internet 16. In addition, information related to reservations, outings, tournaments and leagues is displayed on the interactive Tee Sheet.

Variables that determine the look and functionality of a Tee Sheet include the date, number of 9 hole sets, set names, start and end time of operation, interval

20   between tee times, and color codes.

The user interacts with the Tee Sheet simply by clicking in the desired time slot and choosing functions from a menu. Reservations made by golfers over the internet 16 pop up automatically in real time on facility clients' screens 11; no reload of the screen is required. Re-displaying the Tee Sheet in a conventional way on the facility client 11,

25   would cause a page reload. Any page reload is time consuming and confusing to the user who might be in the middle of a process when the reload occurs. Delaying the reload would open the potential for double bookings, so the ability to "pop up" reservations on the facility clients 11 is important.

One facility client can display the Tee Sheets from multiple different courses if,

30   for example, a management company owns multiple courses. The facility client 11 does not require downloading of large graphics over the internet and keeps a synchronized local copy of the data it needs, and so can be located remotely and still operate very

efficiently. This efficient remote operation makes possible: 1) regional facility server backups; 2) remote Tee Sheet management; 3) management of multiple courses from one facility client (an essential feature for large management companies with multiple facilities).

5   Tee Sheet Set Up

The Tee Sheet is setup color coded by literally painting it using the mouse. The planned occupation of the golf course is reflected through color coded time slots. Each color represents a certain play type. Each play type is color coded. Colors can be set up individually by each facility. The settings are saved in the reservations database 20 and

10   22.

The color coded timeslots must be translated into database records in order to reflect available times for the WEB application and to store the Tee Sheet. The facility client application 11 consolidates tee time data to form time blocks. These time blocks are passed to the reservations databases 20 and 22, where they are stored. The time

15   blocks are approximately 50 times more efficient than traditional approaches to storing tee time information, making the reservations database scalable to very large memberships and heavy transaction loads.

QuickEdit Tool.

A QuickEdit Tool 55 automates the process of setting up a website for a facility

20   by dynamically creating the desired directory structure and web page files in HTML format for displaying a web page. The QuickEdit Tool 55 operates in the background permitting someone with no technical expertise to create a website for interfacing with the reservation system 10. Photographs may be uploaded directly into a custom photo gallery directly from the hard drive of the associated computer or from an attached

25   digital camera. Photographs in the custom photo gallery may be edited by the QuickEdit Tool 55 prior to placing the photograph on a web page. Using the the QuickEdit Tool 55 a calendar, chat room, and message board can be created and edited for use on the website.

Automatic calculations for Straight 18, Wave and Shotgun

30   Based on defined set playtime and set path, the system calculates commonly used planing methods such as Straight 18, Wave, and Shotgun Start, step 46 of Fig. 4.

This gives the golf course manager a powerful planing tool for maximizing the occupation of the golf course.

The golf course manager can easily set up the Tee Sheet by clicking the mouse in the first time and then clicking the mouse in the last time. The system will then automatically paint the Tee Sheet for the appropriate available tee times. It also will automatically block off the appropriate tee times on the back 9 for 9 hole play only. The 9 hole play will be based on the play time to play the 9 holes. For example, if it takes two hours to play the back 9 there will be two hours worth of 9 hole tee times available on the back 9. The system automatically paints the Tee Sheet for those times which on paper was a difficult thing because the manager had to know the play time for the 9 holes and calculate the proper number of tee times available for 9 hole play on the back 9 based on the interval between the tee times.

To setup a wave Tee Sheet, the manager simply clicks on the start time of the wave and the system will automatically paint the Tee Sheet for the appropriate available and occupied times for the wave. For the manager to do this on paper, they would have to know the play time for each 9 holes and then use the shorter of the play times to take tee times for the front 9 and back 9. For example, if it takes two hours to play the front 9 and two and a half hours to play the back 9, the manager would take tee times for two hours on both 9's and block off the Tee Sheet for two and a half hours after the last available tee time. This involves a lot of calculation and would be difficult for the manager to display properly on the paper Tee Sheet. The tee time reservation system accomplishes this task automatically and color codes the Tee Sheet to identify wave or straight 18 hole times. The reservation system also is flexible enough that the manager can easily extend the occupied time on the wave by overriding the occupied time. The manager would do this if they knew that it was going to take longer to play the wave for that specific day. The tee time reservation system also color codes the Tee Sheet for identifying tee times as 9 or 18 hole times or a 9 hole or 18 hole time only.

For shotgun starts, the tee time reservation system automatically blocks off the appropriate occupied time and 9 hole times. The NetCaddy tee time reservation system also automatically allows the manager to set up shotgun starts for smaller groups of 50 or less golfers. The system will automatically block the appropriate times for the first and tenth hole. On paper this is one of the most difficult calculations for a

manager to make. The manger must block off the Tee Sheet for the amount of play time based on the number of players. The manager also has to know the play time for each 9 holes to block off the appropriate amount of time prior to the shotgun start for occupied time and 9 hole play. For example, if it took two hours to play each 9 holes,

5   the manger would have to block off two hours before the shotgun as occupied and two hours before that as 9 hole play only. The system can also handle reverse shotgun starts, where golfers start on the back nine.

Set Path for 27 hole+ golf courses

The system includes the capability to define and change set paths, step 48 of

10 Fig. 4. On a golf course with 3 or more 9 hole sets, it is important to plan the path of 18 hole tee times, outings, tournaments and leagues. For example, the manager, on a 27 hole course can set up two of the nine holes as an 18 hole course and the third 9 as a 9 hole course. In the afternoon the manager can run a triple wave over all three 9's. This means that the manager can have the A 9 playing to B and B playing to C and C

15 playing to A. On paper this is a difficult thing to manage because of the requirement to group the 9's together and color code them different for the mourning and the afternoon. The reservation system automatically groups the 9's together and color codes them in one way in the morning and a different way in the afternoon.

League Scheduler

20   The application has a built-in league scheduler, 50 (see Fig. 4). The reservation system permits the manager to fill out an electronic league form that is stored in the database on the server. When the manager is finished filling out this form the system automatically blocks the appropriate time on all the Tee Sheets for the scheduled days of the league. In addition, the manager can reconfigure one specific league date. For

25 example, the manager can change the time of play for one of the league dates, or the manager can have the league play different 9's every day of the league or specific days. The manager can also enter the players of the league in a Player List and then check them off each day that they play in the league. The league scheduler provides a means of alternating leagues, changing league configuration for each day, and automatically

30 generating a player list.

Recalculation of reservations caused by change of interval

The interval can be changed by the golf course staff for any time of any day, step 52. Traditional systems can support only one interval per day or sometimes alternating intervals. The Netcaddy system can have any number of straight or alternating intervals, switching them throughout the day. This flexibility is possible because of the use of the electronic grid invention. If there are reservations on that day, the program automatically recalculates all tee times to the next closest match, according to the interval.

A unique "cursor assistant" provides context sensitive help based on both the location and the current process step. As the user moves the cursor around on the screen, this help text follows along with the cursor, suggesting what things would be appropriate to do next. This is very useful, because the information is right where the user's eye is focused, and further because the context sensitivity of the help can take into account where the cursor has been moved. The cursor assistant is a unique invention that can be used not only with all kinds of reservation systems, but also for many other kinds of software applications.

Golfer Client Interface

Referring to Fig. 5, when a golfer first accesses the internet interface, the first thing he will have to do is fill out the user application. The account set up module 54 coordinates the user input. To fill out the user application, the potential member provides account information such as name, address, phone number, e-mail address, and a password. The user also provides account information such as city/county residency and golf course memberships that may provide him special tee time booking privileges. The special tee time privileges may include advance booking privileges at a golf course and reduced booking rates. Membership information which is not directly related to reservations is stored in the regional members database 19 (see Figure 1).

Either during the registration phase or after setting up an account, the golfer has the ability to create a favorite golfer list called a buddy list 56. The user can simply fill in his buddy's name, phone number, and e-mail address in the correct boxes and that person will be added to the user's buddy list. There is no limit on how many golfers can be added to the user's buddy list. The user can even set up different buddy lists specific to certain cities. The golfer can also select from the participating courses, his favorite

courses and add the courses to his favorite course list. A favorite course list can also be set up so that it is specific to a city.

Searching for a Tee Time by Time

To search for a tee time by time the user selects the Search by Time method,
5   step 58. The interface displays a calendar, time, and the list of courses. The member selects the desired month and day upon which he wants to play. Then, the desired time the member wants to play is selected. Finally, the desired courses are selected from the participating courses, to search for a tee time on the selected date and time. In the list of participating courses, the number of days in advance that the member will be able to
10   book tee times is displayed. The member can choose all courses or a subset of courses from the list of participating courses.

The system then searches the selected courses for available tee times at the chosen time and date. The system searches one-half hour before the originally chosen time to one-half hour after. The user receives a page that lists the golf courses
15   that have the selected time available on the selected date. If there are no times available, the golfer receives a notice of such. The member may then expand the search by one hour, two hours, three hours, etc. Once the member receives a list of courses having the selected time available on the selected date, he selects the desired course. The member is then notified as to whether the golf course is a nine-hole, an
20   eighteen-hole, or a nine- or an eighteen-hole course. All the reservation searching is performed against the reservations database (20 in figure 1). Since this database is connected to the internet by high speed lines (23 in figure 1) the latency time for searches is very short. If the searches were to be performed over the slow telephone line (15 in figure 1), the latency time would be unacceptable. The latency times would
25   even be unacceptable if the telephone line was upgraded to a line 5 to 10 times faster than a simple telephone line, because of the volume of data which would need to be transported over the wire. The multi-tiered reservations application 10 makes possible short latency time in reservation searches by placing a copy of the data where it is needed, and synchronizing all the copies in real time.
30   Next, the golfer selects nine or 18 holes. Once the golfer selects the desired time, the tee time at the desired course is locked in. The next screen the golfer will see will display all of his information and then a space to type in his credit card number to

pay the transaction fee. On this page the golfer will be able to add his fellow golfers. He can either choose from his buddy list or add them to his buddy list on the fly if he enters golfers who are not already in his buddy list.

Then, a window displays the no show and cancellation policies for that golf

5   course. The member has to click "I agree" to these policies in order to book the time. Once the member clicks "I agree," his credit card is electronically transmitted through Authorize.Net to authorize the credit card for the transaction fee.

Once the card is approved, the golfer receives an authorization code and an electronic coupon, which is valid at the chosen golf course. The coupon is created by

10   the golf course and can be altered at anytime by the management of the golf course. At this time, the tee time is automatically booked and displays the golfer's name on the Tee sheet at that golf course. When the tee time is booked, an e-mail is automatically sent to the golfer's buddies, notifying them of the tee time.

Search by Course

15   To search for a tee time based upon a desired course the golfer selects the Search by Course method, step 60. The interface displays a calendar and a listing of participating golf courses. First, the golfer selects the proper month and day from the calendar that he would like a desired tee time. Then, the golfer selects the desired golf course. A web page displays all of the available times and whether it is a nine-hole,

20   18-hole, or 9- or 18-hole tee time. Then, the golfer selects either the 9- or 18-hole desired tee time.

Once the golfer has selected the desired time, the tee time at the desired course is locked. The next screen displays the golfer's account information and a space to type in a credit card number to pay the transaction fee. The golfer is then prompted to add

25   his fellow golfers. He can either choose from his buddy list or add them to his buddy list on the fly if he enters golfers who are not already in his buddy list. Then, the no show and cancellation policies for that golf course are displayed. The golfer must click "I agree" to these policies in order to book the time. Once the golfer clicks "I agree," his credit card will be electronically transmitted through Authorize.Net to authorize the

30   credit card for the $5.50 transaction fee. Once the card is approved, the golfer receives an authorization code and an electronic coupon, which is valid at the chosen golf course. The coupon is created by the golf course and can be altered at anytime by the

management of the golf course. At this time, the tee time is now automatically booked and displays the golfer's name on the Tee sheet at that golf course. Once the tee time is booked, an e-mail is automatically sent to the golfer's buddies notifying them of the tee time.

5   Once the golfer has booked his tee time forty-eight hours prior to the cancellation period, he will receive an automatic e-mail reminder about his tee time. This e-mail reminder will include the no show and cancellation policy and directions to the golf course. The golfer also receives a second e-mail reminder twenty-four hours prior to his tee time. This second reminder is also sent to the golfer's buddies provided

10   that their names and e-mail addresses were provided when the tee time was booked.

At any time, the golfer has the ability to go back into the Reservation System on the web to change his information. The golfer can also view his booked tee times at any time. If the golfer selects Book tee time, he will get a list of all his booked tee times. tee times that are outside of the cancellation period will show up in blue. tee

15   times that are inside the cancellation period will show up in red. The system automatically displays for you, the amount of time you have to cancel the tee time.

Automated E-mail Notification

The reservation system includes a notification manager 64 that resides on the server 18 of figure 1. The notification manager 64 automatically counts down the days

20   before a golfer's booked tee time is within the cancellation window. Important changes in a golfer's reservation trigger an Automatic e-mail Notification to the golfer. Such situations include: reservation cancellation by a facility, reservation rescheduling by a facility, 24 hours prior to the reservation time, 48 hours prior to the closing of the cancellation window. If e-mail addresses are provided for a golfer's buddies, the

25   buddies will also receive the Automatic E-mail Notifications.

Automatic E-mail notifications are handled in two ways, immediate and scheduled. In either case, all the information necessary to reproduce the notification at the needed time (i.e., e-mail address, time and date stamp, and notification information) is stored with the notification.

30   Immediate Notifications are added to a queue for immediate processing step 66. They are triggered by events for immediate handling such as a facility cancellation of a

reservation. In such a situation, the notification is entered into the immediate notification queue.

Scheduled Notifications are triggered by events for future handling step 68. A trigger is scheduled which, when triggered, will add the notification to the immediate

5   queue. For example, when a new reservation is booked, scheduling a reminder to occur 24 hours prior to the reservation time. The scheduler first sets a trigger schedule the notification. When the trigger is activated, the notification is entered into the immediate notification queue. When the notification reaches the head of the immediate queue, the e-mail address (stored with the notification) is sent a copy of the notification

10   information.

Favorite Courses

A list of favorite courses is maintained for each golfer, step 70. A golfer creates the list by selecting favorite courses from the list of participating courses. Separate lists of Favorite Courses can be kept for each city. A golfer's Favorite

15   Course list is available to him when searching for a tee time by time or course. The favorite courses are also associated with a city in a 1:1 relationship. Thus, the entire list of favorites can contain courses specific to each city. When the golfer is accessing the server from within the context of a single city, the favorites associated with that golfer and that city would be available to the golfer in that context.

20   Buddy List

The buddy list is a listing of golfers that a golfer of the Reservation System designates. The database includes the phone numbers and email addresses of the golfer's buddies. The buddy list is available to the golfer anytime he books a tee time. When the golfer books a tee time and adds three buddies to that tee time, an automated

25   e-mail is sent to the buddies notifying them of the tee time. Those buddies also receive an automated e-mail reminder of the tee time.

The buddy list is attached to the golfer's record in the server database. Because it is a 1:N relationship, an individual golfer can have as many buddy lists associated with himself as he desires. The buddies are also associated with a city in a 1:1

30   relationship. Thus, the entire list of buddies can contain courses specific to each city.

17

When a golfer is using the server from within the context of a single city, the buddies associated with that golfer and that city are available to the golfer in that context.

Frequent Golfer Program

The frequent golfer program is designed so that every round of golf that a golfer

5   books over the web is stored on the server, step 72. For a predetermined number of rounds that are booked over the web, the golfer will receive a free round of golf from one of the participating golf courses in the reservation system.

Coupon

The golfer receives an authorization code from Data Transfer Associates when a

10 reservation is booked over the web. A coupon that is created by the participating golf course where the golfer booked the tee time is stored in the database on the server. When the authorization code is sent to the golfer through the Internet, the coupon associated with the golf course is displayed to the golfer. The golfer then prints the coupon and the authorization code and presents it at the golf course, step 74.

15 View Tee Times

View tee times, step 62, is designed so that the golfer can view all of his tee times that he booked through the Reservation System. All tee times for that golfer are stored in a database on the regional server, 18 in figure 1. The golfer is able to view all of the tee times through a web page that extracts the data from the database. tee times

20 that are outside the cancellation window are displayed in blue. tee times inside the cancellation window are displayed in red.

When the booked tee times are stored in the database, the system automatically logs the time down to the minute until the cancellation period. Forty-eight hours prior to the cancellation period, the database automatically sends an email reminder to the

25 golfer that he has forty-eight hours to cancel his tee time. Twenty-four hours prior to the tee time, the database automatically sends an e-mail reminder to the golfer and his buddies of the tee time.

Personalized statistical database for each member.

Referring to Fig. 2, the system 20 includes a statistics database for each golfer

30 that includes statistics related to the golfer's game. The golfer is able to view all of these statistics on the web in a graphical format, as well as being able to view individual rounds. When golfers enter the above information for their database, this renders on the

fly to a page that ranks all of the golfers at a particular facility in each of the statistical categories. For example, there is a web page that lists the top ten in driving, distance, the top ten in the percent of fairways in regulation, and the top ten in greens in regulation, etc. The golfer then has the ability to view not only the top ten but can view the next ten and so on down the line for each of the statistical categories above. Statistics that each member is able to accumulate include the following:

- Driving distance - The golfer will enter the distance of two drives on two different holes.

- Percent of Fairways in regulation - The Golfer will have approximately fourteen opportunities to enter whether he hit the fairway or not. On each hole that has an opportunity to hit the fairway. The golfer will have a radio button to enter that yes he did hit the fairway or no he did not hit the fairway. There will also be a note field for the golfer to input notes with respect to that hole.

- Percent of Greens in regulation - The Golfer will have eighteen opportunities to enter whether he hit the Green or not. On each hole that has an opportunity to hit the Green. The golfer will have a radio button to enter that yes he did hit the Green or no he did not hit the Green. There will also be a note field for the golfer to input notes with respect to that hole.

- Percent of Sand Saves - The golfer will enter how many times he hit the ball in the sand and out of that he will enter how many times he got up-and-down. There will also be a note field for the golfer to input notes with respect to that hole.

- Number of Putts per round - The golfer will enter the total number of putts that he had for a round or 18 holes. Then the average number of putts per hole will be calculated of the fly. There will also be a field to enter the number of three put holes the golfer had.

- Average Score - The golfer will enter his score per 18 hole round.

E-Commerce POS System

Included within the Reservation System is a point of sale (POS) manager 76. The POS manager 76 functions like a web store for sales over the internet, as well as an in house store for sales over the counter. The POS manager 76 allows the counter clerk

19

to ring up reservations directly through the internet manager 76. As for functioning as a POS manager 76 for the in house store, the manager POS 76 system maintains the entire inventory of products that are for sale in the pro shop. The POS manager 76 has inventory control functions and accounting system functions necessary for in house record keeping.

The POS manager 76 allows the manager of the store to go through the entire list of offerings from various suppliers and manufacturers and check off which products to stock or make available for sale on the web. The store manager is also able to change the products for sale on the web by day, by week or by month. This approach is much easier for the shop manager than the traditional process of building and revising an inventory list line by line for each item to be sold or stocked.

The Customized Golf Academy

The customized golf academy 78 allows golfers to fill out a profile questionnaire over the web about their game. Based on their profile, they receive customized golf lessons over the web and via CD-ROM. The Golf Academy 78 provides customized lessons to the user with pictures, text and digital video. The Golf Academy 78 is a marriage between a website and a CD-ROM. The pictures and the text runs through the web browser. The digital video runs through the CD-ROM. Golfers receive instruction on the setup, posture, alignment, ball position, back- swing, downswing, impact position, and the proper way to practice. The golfers also receive instruction on golf fitness. Golfers not only receive customized instruction with tips and drills on how to improve their golf game, but they also receive fitness exercises that assist them in improving their golf game.

The Golf Academy 78 also features the drill "6 - points of the golf swing". The "6 points of the golf swing" drill is based on the study of the martial arts. The golfer is instructed to do this drill twenty minutes a day at home to develop their muscle memory. The drill is done by turning the club to 6 learned positions in the golf swing. For example, the golfer is instructed to turn the club to the exact position 1, exact position 2, exact position 3, and so on through position 6. By turning the club to these exact positions and repeating this drill for twenty minutes a day, the golfer learns the golf swing and develops muscle memory.

Reliability

The reservation system 10 was designed to be reliable, with the following reliability features: 1) the facility servers 12 can operate autonomously if the communication through the internet 16 is broken; 2) the facility servers 12 will automatically reconnect over the internet when service becomes available and the databases will then automatically re-synchronize; 3) If a facility server 12 fails, an automatic fax on demand system will forward a paper copy of the tee sheets to the course; 4) If a facility server 12 fails, a backup facility server located regionally (not shown) can be loaded with the facility database 22 (the data for which is stored on the regional reservations server 18) and act temporarily as the facility server. This type of backup is only possible because of the ability of the facility clients 11 to operate remotely; 5) the regional servers 17 and 18 are backed up to tape.

While the invention has been described in its presently preferred embodiments, it will be understood that the invention is capable of certain modification and change without departing from the spirit of the invention as set forth in the appended claims.

21

What is Claimed is:

1.   A reservation system for accepting a reservation from an reservation client communicated over the Internet, comprising;

a facility reservations database associated with a facility, stored on a facility server for storing facility reservation information;

5   a facility client associated with the facility having a user interface for providing an operator a means to enter and review reservations information, said facility client including a client reservations database for storing a subset of the facility reservation information; and

a regional reservations database stored on a regional server for storing
10   reservation information related to a plurality of facilities, said regional reservations database being synchronized with the facility reservations database and the client reservations database such that the regional reservations database provides a backup data source, whereby communications volume over the connection of the facility to the internet is reduced and the latency time for internet based reservations searches is
15   reduced.

2.   The reservation system of Claim 1 wherein the facility server is configured to receive a reservation request from a Web client that is coupled to the internet.

3.   The reservation system of Claim 1 further comprising a Streamer
20   Protocol defining a mode of communication between the facility servers, the regional servers and the facility clients, wherein the Streamer Protocol includes data compression.

4.   The reservation system of Claim 3 wherein the Streamer Protocol further comprises prioritization of communicated data.

25   5.   The reservation system of Claim 3 wherein the Streamer Protocol further comprises a persistent IP connection.

6.   The reservation system of Claim 1 wherein the facility client user interface further comprises a cursor assistant for providing context sensitive help messages that are cursor location and process step sensitive, such that a message is
30   displayed near the cursor.

7.   The reservation system of Claim 1 further comprising a facility client application having self-contained graphics and storing synchronized data derived from the facility reservations database, thereby providing rapid response times for internet communications over a slow telephone line between the facility client and the
5   facility server.

8.   The reservation system of Claim 1 further comprising a positive locking system to prevent double booking of reservations.

9.   The reservation system of Claim 7 wherein the facility client application does not include browser software, nor any DLLs, nor any Personal Web
10 Server software, thereby facilitating installation of the reservation system.

10.   The reservation system of Claim 8 further comprising an automated update facility for upgrading the facility servers on a mass basis.

11.   The reservation system of Claim 8 further comprising a payment manager to provide for secure payment via credit card over the internet, said payment
15 manager further providing authorization for services reserved over the network.

12.   The reservation system of Claim 7 wherein the facility client application further comprises an automatic dialing system to reopen communications when a connection to the internet is lost.

13.   The reservation system of Claim 8 wherein the facility client manages
20 more than one facility server.

14.   The reservation system of Claim 8 wherein the Web client further includes a customer internet browser client application running under the control of a web browser, thereby facilitating reservation activities.

15.   The reservation system of Claim 8 wherein the facility reservations
25 database further includes data blocking for blocking multiple tee times into blocks of data for communication to the regional reservations database.

16.   The reservation system of Claim 8 further comprising a regional backup server temporarily acting as the facility server, wherein the regional backup server is loaded with backup data from the regional server such that the regional
30 backup server replaces the facility server in the event of failure of the facility server.

17.   The reservation system of Claim 8 further comprising a point of sale manager coupled to the facility database, for presenting pre-defined inventory records
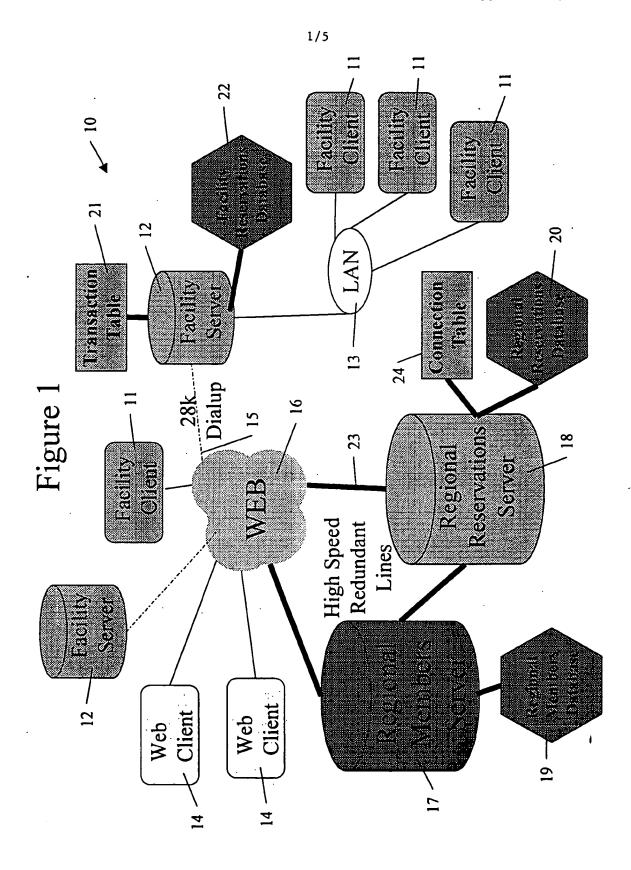
to the shop manager for selection, whereby the process of setting up and managing an inventory is facilitated.
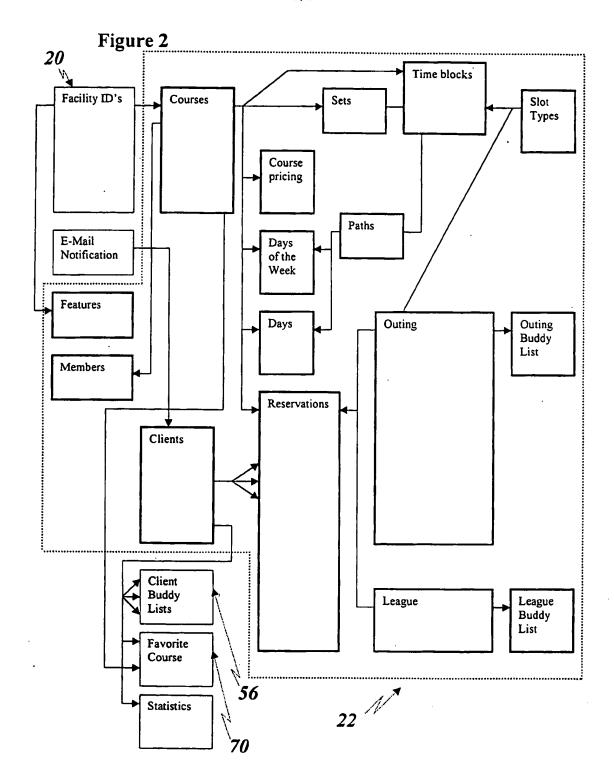
18.   The reservation system of Claim 8 customized for golf reservations wherein the facility client includes a Tee Sheet design system.

19.   The reservation system of Claim 18 wherein the Tee Sheet design system includes a planner for selecting a planning method, said planning method being selected from the group of: straight 18, shotgun, reverse shotgun, and wave.

20.   The reservation system of Claim 18 wherein the facility includes at least one golf course, and wherein the Tee Sheet design system further defines a set path for the golf course.

21.   The reservation system of Claim 18 wherein the Tee Sheet design system further comprises a league scheduler for scheduling golf leagues.

22.   The reservation system of Claim 18 wherein the Tee Sheet design system further comprises a golf tournament scheduler.

23.   The reservation system of Claim 18 wherein the Tee Sheet design system further comprises an electronic grid upon which the Tee Sheet is built.

24.   The reservation system of Claim 18 further comprising an electronic golf academy to create custom electronic courses based on the profile of the golfer.

25.   The electronic golf academy of Claim 24 further comprising a method of instruction based on the martial arts and known as the "six points of a golf swing".

26.   The reservation system of Claim 18 wherein the customer internet browser client application further includes a search module activable to search for golf tee times by a reservation factor, wherein the reservation factor is selected from the group of: golf course, geographic region, and time.

27.   The reservation system of Claim 18 wherein the facility reservations database further includes a user buddy list and favorite course list for at least one reservation client.

28.   The reservation system of Claim 14 further comprising a notification module for sending immediate and scheduled email notifications and reminders to the reservation client.

29.   The reservation system of Claim 14 further comprising a frequent golfer program for generating coupons for purchases at the facility.

30.   The reservation system of Claim 14 wherein the Web client further includes a search module for conducting searches of the regional reservations database, whereby searching the reservation information replicated in the regional reservations database instead of the facility reservations database provides reduced

5   latency times resulting from using a high speed internet connection communication.

31.   The reservation system of Claim 14 further comprising a statistics manager for compiling statistics associated with the client.

32.   The reservation system of Claim 31 wherein the statistics are selected from the group of: fairways per round, putts per round, length of drive, greens in

10   regulation, total score, and score with handicap.

33.   The reservation system of Claim 14 further comprising a QuickEdit Tool for creating and editing a website.

Figure 1

Figure 2
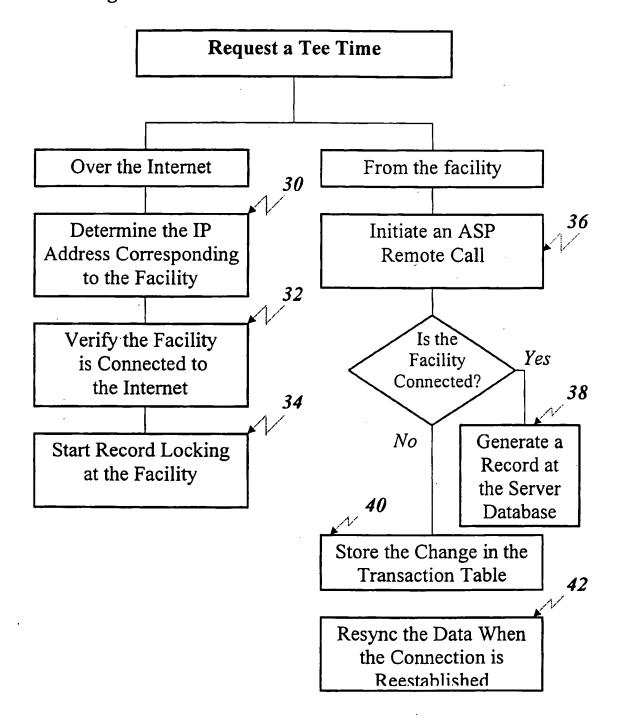
Figure 3

Request a Tee Time

Over the Internet   *30*   From the facility

Determine the IP Address Corresponding to the Facility   *32*

Initiate an ASP Remote Call   *36*

Verify the Facility is Connected to the Internet   *34*

Start Record Locking at the Facility

Is the Facility Connected?

Yes

No

Generate a Record at the Server Database   *38*

40 Store the Change in the Transaction Table

Resync the Data When the Connection is Reestablished   *42*

Figure 4

44 Set-Up a Facility

- Courses
- Policies
- Tee Sheet Format
- Client List

46 Calculate Plan Methods

- Straight 18
- Wave
- Shotgun

48 Set path

50 League Scheduler

52 Recalculate Reservations

Figure 5

_54_

| Account Set-Up Module |

_55_

| Quick Edit Tools |

_58_

| Search Module | —— | Search By Time |

_60_

| Search By Course |

_56_

| Create Buddy List |

_62_

| View Tee Times |

_66_

| Immediate Notification |

_64_

| Notification Module |

| Scheduled Notification |

_68_

_72_

| Frequent Golfer Module |

_74_

| Payment Module |

_78_

| Customized Golf Academy |

_76_

| Point of Sale Manager |

INTERNATIONAL SEARCH REPORT

A. CLASSIFICATION OF SUBJECT MATTER
IPC(7) : G06F 17/60
US CL : 705/5; 709/203; 707/201,204
According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 705/5; 709/203; 707/201,204

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

NONE

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

WEST, DIALOG

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 5,537,642 A (GLOWNY et al) 16 July 1996, col. 1, lines 15-42, and col. 3, line 34 thru col. 6, line 67.	1-33
X	US 5,652,908 A (DOUGLAS et al) 29 July 1997, col. 1, lines 21-47, and col. 3, line 37 thru col. 6, line 67.	1-33
A	US 5,537,533 A (STAHELI et al) 16 July 1996, entire document.	1-33
A	US 5,724,575 A (HOOVER et al) 03 March 1998, entire document)	1-33
A	US 5,841,980 A (WATERS et al) 24 November 1998, entire document.	1-33

☒ Further documents are listed in the continuation of Box C.   ☐ See patent family annex.

*	Special categories of cited documents:	"T"	later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"A"	document defining the general state of the art which is not considered to be of particular relevance	"X"	document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"E"	earlier document published on or after the international filing date		
"L"	document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	"Y"	document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"O"	document referring to an oral disclosure, use, exhibition or other means		
"P"	document published prior to the international filing date but later than the priority date claimed	"&"	document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
03 JULY 2000	11 AUG 2000

Name and mailing address of the ISA/US	Authorized officer
Commissioner of Patents and Trademarks Box PCT Washington, D.C. 20231	ALLEN MACDONALD
Facsimile No. (703) 305-3230	Telephone No. (703) 308-9708

Form PCT/ISA/210 (second sheet) (July 1998) *

11/15/04, EAST Version: 2.0.1.4

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A,P	US 5,937,415 A (SHEFFIELD et al) 10 August 1999, entire document.	1-33
A,P	US 5,960,406 A (RASANSKY et al) 28 September 1999, entire document.	1-33